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ABSTRACT

Because the decline in high quality and well-attended science education programs has been a source of concern to educators, policymakers, and leaders of business and industry, a survey of secondary school science education was conducted in 1981 by the Ohio Department of Education. Questionnaires were sent to 161 public high schools, representing 26 percent of the public school districts in the state; 131 (81 percent were returned). The questionnaire was divided into four categories: (1) staff/staff development; (2) curriculum development; (3) classroom strategies; and (4) course inventory. Data are provided in terms of responses to each question asked on the survey related to the four categories and sections within each category. Data on the characteristics of respondents are also included. To date no statistical test of significance has been done on the data. The complete questionnaire and a list of secondary school science course titles are included in appendices. Findings indicate among others that few of the federally funded science programs are used in Ohio schools today, a high (81.4 percent) use of laboratory work, concerns for school/laboratory safety, and that a large percentage do not have proper safety equipment in laboratories. (Author/JW)

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SCIENCE

in

Ohio's Secondary Schools



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A Status Report

prepared by

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Ohio Department of Education

1982

Introduction

For many years the decline in high quality and well-attended science education programs has been a source of concern to educators, policymakers, and leaders of business and industry. That concern has led to a reexamination of the status of science education in schools. One such reexamination was conducted in 1981 by the Ohio Department of Education. A survey questionnaire was sent to a random sample of secondary schools in the state. The sample represented 26 percent of the public school districts in the state.

Characteristics of Respondents

Science survey questionnaires (see Appendix A) were sent to 161 public high schools; 131 (81 percent) were returned. Respondents reflect the diversity found in Ohio's secondary schools. Based upon classification developed by the U.S. Census Bureau, 61 percent of the respondent schools were classified as central city, 13.7 percent as urban, 24.4 percent as suburban, and 55.7 percent as rural. The mean of per pupil expenditures was calculated for each of the four classifications: 47.3 percent of the respondents were above and 52.6 percent were below the respective mean scores. Respondents represented districts with average daily membership (ADM) of 0 to 999 (16.0 percent); 1000 to 1999 (38.1 percent); 2000 to 3499 (21.3 percent); and 3500 and above (24.4 percent). Respondent schools were also categorized by enrollment: under 400 (17.5 percent); 400 to 799 (44.3 percent); 800 to 1399 (26.7 percent); and over 1399 (11.4 percent).

Questionnaire Responses

The following data represent the percentage of responses to each of the questions asked on the survey. To date no statistical test of significance has been done on the data. The questionnaire was divided into four categories: staff/staff development, curriculum development, classroom strategies, and

course inventory. The purpose of this report is to enumerate the findings in each category and, where possible, to draw some conclusions based on the findings.

Staff/Staff Development

Six questions were asked in this category. Their focus was on the chairmanship and department meetings. (See Appendix A.)

Data suggest that the number of full-time science teachers is related to school enrollment. The range in the number of full-time science teachers is from 1 to 15. Eighty-one (81) percent of the schools responding indicated that they have from 1 to 5 full-time teachers in science.

Of the schools having more than five full-time science teachers, none had an enrollment of less than 800. A majority (63 percent) of the schools indicated that they employ no part-time science teachers. Overall, approximately 24 percent employ one part-time science teacher. The greatest number of part-time science teachers employed by a school is four.

Science department chairpersons, either full-time or part-time, are utilized in 47.7 percent of the schools. No schools with enrollment over 1399 and only 8.8 percent of schools with enrollment of 800 to 1399 reported no department chairpersons. Of the schools with enrollment under 400, 69.6 percent indicated no department chairpersons. In general, the data suggest that schools with an enrollment over 1400 tend to have chairpersons. Table 1 summarizes the data for department chairpersons.

Table 1. Percent of Schools Having Department Chairpersons.

PRESENCE OF CHAIRPERSON	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
No	32.3	69.6	39.7	8.8	0.0
Yes-Full	22.3	17.4	22.4	29.4	13.3
Yes-Part	25.4	0.0	15.5	44.1	60.0
Yes	19.2	13.0	22.4	17.6	20.0

Compensation for department chairpersons appears to be related to school enrollment. Schools with an enrollment of 800 or more tend to provide the chairperson with either release time or monetary compensation or both. See Table 2 for this data.

Table 2. Percentage of Schools Indicating Some Form of Compensation For Department Chairpersons.

TYPE OF COMPENSATION	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Release Time	9.5	7.7	4.0	12.9	13.3
Compensation	19.4	0.0	22.0	29.0	26.7
Both	20.9	0.0	8.0	22.6	53.3
Neither	50.1	92.3	66.0	35.5	6.7

Statewide, according to the sample, 9.5 percent of the schools give release time, 19.4 percent provide extra money, 20.9 percent give both release time and extra money. Fifty (50) percent reported neither release time nor money as compensation for science department chairpersons.

The number of department meetings, as indicated by the data, is also related to school enrollment. As Table 3 shows larger schools tend to conduct a greater number of department meetings.

Table 3. Percent of Schools Indicating Number of Department Meetings Held Each Year.

NUMBER OF MEETINGS	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
0	20.7	47.6	19.6	15.6	0.0
1 - 3	36.5	47.6	57.1	28.1	13.3
4 - 6	14.6	4.8	16.1	37.5	20.0
7 - 9	14.0	0.0	7.1	15.6	33.3
9+	7.5	0.0	0.0	3.1	26.7

Perhaps more important than the number of meetings held is the kind of meeting held. The character of department meetings appears similar across school enrollment categories despite the variation in the number of meetings. Respondents were asked which of the following activities characterized their department meetings:

1. Keeping "ALIVE" professionally.
2. Learning about new curricula.
3. Learning new audiovisual materials.
4. Studying new methods of teaching.
5. Analyzing problems, such as discipline, faced by all teachers.
6. Facilitating the use of new textbooks.
7. Providing opportunity for teachers to share ideas with other teachers.
8. Building enthusiasm for teaching.
9. Describing new materials and information of direct use in the classroom.

Of the nine given activities, the activity "providing opportunity for teachers to share ideas with other teachers" was the activity ranked number one for all school enrollment categories. "Analyzing problems such as discipline," "facilitating the use of new texts", and "describing new materials and information of direct use in the classroom" were the next highest ranked activities across all school enrollment categories. Table 4 summarizes the data relative to the characteristic of department meetings.

Table 4. Characteristic Activities of Department Meetings.

TYPE OF ACTIVITIES	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Keep Alive	27.1	17.4	20.7	41.2	35.7
Learn About Curricula	39.2	4.3	39.7	58.8	46.7
Learn New Audiovis. Mat.	23.1	8.7	19.0	32.4	40.0
Analyze Problems	48.5	26.1	43.1	58.8	80.0
Facilitate Use of Text	46.9	17.4	44.8	70.6	46.7
Study New Teach. Meth.	19.2	13.0	17.2	23.5	26.7
Provide Oppor. Share Ideas	63.8	34.8	60.3	79.4	86.7
Build Enthus. for Teach.	21.5	8.7	15.5	32.4	40.0
Describe New Mater. and Info.	51.5	26.1	50.0	61.8	73.3

Curriculum Development

Forty-five questions comprised the portion of the questionnaire surveying curriculum development. These forty-five questions can be organized into the following sub-categories: course of study development and use; special programs; laboratory work and facilities; laboratory safety; student activities; graduation requirements; and science class enrollments. The findings for each of these seven categories are briefly explained in the following pages.

1. Course of Study Development and Use.

Approximately one-half of the respondents (49.6 percent) indicated course of study revision every five years; 11.4 percent indicated annual revision; 6.5 percent indicated revision every three years; and 32.5 percent indicated more than five years between revisions. Table 5 summarizes this data by school size.

Table 5. Course of Study Revision by School Size.

TIME DURATION	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Annually	11.4	5.0	16.1	9.1	7.1
Every 3 Years	6.5	5.0	10.7	3.0	0.0
Every 5 Years	49.6	55.0	44.6	57.6	42.9
Longer Than 5 Years	32.5	35.0	28.6	30.3	50.0

Use of course of study in instructional preparation was reported by 46.5 percent of the respondents. "Some" use of the course of study was indicated by 48.0 percent of the respondents, and 5.5 percent indicated that the course of study is not used. A majority (60.5 percent) reported that 81 - 100 percent of the staff is involved in course of study revision, while a minority (16.8 percent) indicated staff involvement of 0 - 20 percent. Table 6 summarizes the data for staff involvement in course of study revision.

Table 6. Staff Involvement in Course of Study Revision.

PERCENTAGE OF STAFF	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
0 - 20	16.8	31.8	7.4	20.0	23.1
21 - 40	8.4	0.0	13.0	3.3	15.4
41 - 60	10.1	9.1	13.0	10.0	0.0
61 - 80	4.2	0.0	5.6	6.7	0.0
81 - 100	60.5	59.1	61.1	60.0	61.5

Do students and community members have an opportunity to participate in curriculum development? Data from this survey (see Table 7 and 8) indicate that they have little or no opportunity to participate in such an activity.

Table 7. Percent of Schools Providing Student Involvement in Curriculum Development.

STUDENT INVOLVEMENT	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Yes	3.1	0.0	3.5	3.0	7.1
No	70.1	78.3	64.9	75.8	64.3
Sometimes	26.8	21.7	31.6	21.2	28.6

Table 8. Percent of Schools Providing Community Involvement in Curriculum Development.

COMMUNITY INVOLVEMENT	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Yes	6.3	0.0	5.3	12.1	7.1
No	73.2	78.3	78.9	63.6	64.3
Sometimes	20.5	21.7	15.8	24.2	28.6

Increasingly, concern is expressed about curriculum continuity from one grade level to another. Consultant efforts in Ohio have been directed toward assisting school districts develop K-12 courses of study. Data from the survey indicate that a majority (68.0 percent) of school districts are developing K-12 curricula. Table 9 summarizes this data.

Table 9. Percent of Schools with Courses of Study Reflecting K-12 Continuity.

K-12 CONTINUITY	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Yes	68.0	52.2	73.7	67.6	71.4
No	32.0	47.8	26.3	32.4	28.6

2. Special Programs.

Educational opportunities for the gifted have generally increased in education over the past few years. The data from this survey, however, indicate that only 24.8 percent of the secondary schools statewide provide a special program in science for gifted students. Of the schools which do provide a program for the gifted a larger percentage offer this program at the 11th or 12th grade. Additionally, it is generally the larger schools which offer such programs. Tables 10 and 11 summarize this data.

Table 10. Percent of Schools Offering a Program for the Gifted.

GIFTED PROGRAM	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Yes	24.8	8.7	22.8	26.5	53.3
No	75.2	91.3	77.2	73.5	46.7

Table 11. Percent of Schools With Gifted Program at Various Grade Levels.

LEVELS	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
9	10.1	0.0	10.5	8.8	26.7
10	9.3	0.0	7.0	11.8	26.7
11	18.6	8.7	14.0	17.6	53.3
12	20.9	8.7	17.5	20.6	53.3

When asked if they have an advanced placement program for students to earn college credit the following data was found:

Table 12. Percent of Schools With Advanced Placement Program.

ADVANCED PLACE- MENT PROGRAM	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Yes	19.4	13.0	15.8	17.6	46.7
No	80.6	87.0	84.2	82.4	53.3

It is interesting to note that the largest schools represent a majority of the schools offering advanced placement.

3. Laboratory Work and Facilities.

A key ingredient to science instruction appears to be laboratory work. Statewide, 81.4 percent of the respondents indicated the use of laboratory work in science instruction. Of this group, 70.4 percent indicated that students have an opportunity for laboratory work at least once a week, 21.7 percent indicated occasional laboratory work, and 7.8 percent indicated that laboratory work is conducted about once a month.

When asked to indicate the science course with no laboratory work, 26.5 percent indicated General Science. Approximately 12 percent indicated that Earth Science and Physical Science do not have laboratory work. A majority (80.8 percent) reported that laboratory facilities were adequate.

4. Laboratory Safety.

Increasingly, safety is becoming a very important issue for schools and for science teachers. Yet, the results of this survey show that a large number of schools (58.9 percent) do not have an annual laboratory safety check by an outside agency. Further, the results indicate that a large percentage of schools do not have the proper safety equipment in the laboratories. For example, only 31.3 percent of the respondents indicated that they have a shower and only 59.2 percent indicated they have a First Aid Kit. Table 13 summarizes the data regarding safety equipment.

Table 13. Percentage of Respondents Indicating The Presence of Safety Items in Science Laboratories.

SAFETY ITEM	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Eye Fountain	32.4	26.1	36.2	20.6	46.7
Eye Station	35.5	43.5	41.4	44.1	13.3
Shower	31.3	26.1	25.9	26.5	46.7
Fire Blanket	51.1	52.2	63.8	52.9	35.7
Fire Extinguisher	88.4	91.3	86.2	76.5	100.0
First Aid Kit	59.2	60.9	69.0	50.0	57.1
Two Exits	53.9	47.8	53.4	54.5	60.0
Goggles	73.9	82.6	75.9	70.6	66.7
Spectacles (Visitors)	32.2	43.5	36.2	29.4	20.0
Safety Glasses	33.6	39.1	43.1	32.4	20.0
Aprons	65.0	82.6	69.0	61.8	46.7

Respondents were asked to indicate the number of "accidents" in a laboratory in one year. The term "accident" was not defined. Results, as shown in Table 14, appear to indicate that few accidents happen in the science laboratories of Ohio's secondary schools.

Table 14. Percent of Schools Indicating Accidents in Science Classes in One Year.

NO. OF ACCIDENTS PER YEAR	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
None	34.4	47.8	33.9	34.4	14.3
1	31.2	26.1	30.4	25.0	57.1
2	16.0	8.7	17.9	18.8	14.3
3	9.6	13.0	10.7	9.4	0.0
4	4.8	0.0	3.6	9.4	7.1
5	2.4	0.0	1.8	3.1	7.1
More Than 5	1.6	4.3	1.8	0.0	0.0

A critical component to safety in the science laboratory is the teacher's knowledge of safety procedures. A majority of respondents (75.0 percent statewide) indicated that teachers had been instructed about safety and accident procedures. Table 15 summarizes this data.

Table 15. Percent of Schools Indicating Teacher Instruction in Safety Procedures.

SAFETY PROCEDURES	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Yes	75.0	72.7	80.7	67.6	73.3
No	25.0	27.3	19.3	32.4	26.7

5. Student Activities.

Results of the survey indicate that a large number of schools involve students in science clubs and science fairs. Of note, however, is the fact that schools with an enrollment of more than 1400 indicate a high percentage (64.3) for science clubs and a low percentage (26.7) for science fairs.

Table 16 shows the variation in student activities by school size.

Table 16. Percent of Schools Providing Various Student Activities.

SCIENCE ACTIVITIES	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
Science Clubs	48.8	34.8	47.4	54.5	64.3
Science Fairs	41.9	47.8	36.8	52.9	26.7
Science and Humanities Symposia (JSHS)	27.7	17.4	27.6	26.5	46.7
Competitive Tests (JETS)	33.1	26.1	32.8	38.2	33.3

6. Graduation Requirements.

The majority of schools (78 percent) require the state mandated one unit of science for high school graduation. Nearly 21 percent require two units of science for graduation. See Table 17. No one specific course was indicated by the respondents as the one necessary to meet the graduation requirement.

Table 17. Units of Credit Required for Graduation By School Size.

SCIENCE CREDIT REQ.	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
1	77.7	65.2	75.9	88.2	80.0
2	20.8	34.2	24.1	8.8	13.3
More Than 2	1.5	0.0	0.0	2.9	6.7

7. Science Class Enrollment.

Eighty (80) percent of the schools responding indicated that the enrollment in Chemistry classes represents 1 to 15 percent of the total school enrollment. For 31 percent of the respondents this is an increase over previous years. While 96 percent of the respondents indicated that the Physics enrollment represents 1 to 20 percent of the total enrollment, the majority of these indicated enrollment reflective of only 1 to 3 percent of the total school enrollment. This represents an increase of only 23 percent over previous years.

Classroom Strategies

A majority (54.3 percent) of respondents indicated that science classes are taught by the lecture method "just about daily" (see Table 18). Approximately 82 percent of the respondents indicated that computers are never used in science instruction. Table 18 summarizes the various instructional techniques used by science teachers in Ohio secondary schools.

Table 18. Percentage of Respondents Indicating Frequency of Use of Various Instructional Techniques.

INSTRUCTIONAL TECHNIQUE	FREQUENCY OF USE			
	NEVER	LESS THAN ONCE A WEEK	AT LEAST ONCE A WEEK	JUST ABOUT DAILY
Lecture	0.0	0.0	45.7	54.3
Discussion	0.0	9.4	38.3	52.3
Student Reports/ Projects	2.4	83.5	13.4	0.8
Use of Manipulatives	7.8	38.8	46.6	6.9
Televised Instruction	34.9	53.2	11.1	0.8
Computer Assisted Instruction	81.7	15.1	3.2	0.0
Simulations	45.4	51.3	3.4	0.0
Field Trips	20.3	79.7	0.0	0.0
Guest Speakers	21.3	76.4	2.4	0.0
Teacher Demonstrations	7.9	37.0	48.0	6.3

Science Program

During the 1960's many federally-funded science programs were developed as a result of the nationally recognized need for the improvement of science instruction. As evidenced by the results of this survey, few of these programs are used in Ohio schools today (see Table 19).

Table 19. Percentage of Respondents Indicating Use of Federally Funded Programs.

FEDERAL PROGRAM	TOTAL STATEWIDE	SCHOOL SIZE			
		0 - 399	400 - 799	800 - 1399	1400+
BSCS Green	25.9	13.0	10.3	20.6	60.0
BSCS Yellow	12.2	8.7	8.6	11.8	20.0
BSCS Blue	12.5	13.0	5.2	11.8	20.0
Chemical Bond Approach	3.2	4.3	1.7	0.0	6.7
CHEM Study	14.9	8.7	6.9	17.6	26.7
ESCP	10.6	4.3	3.4	14.7	20.0
IPS	11.3	8.7	12.1	17.6	6.7
ISCS	9.4	8.7	10.3	11.8	6.7
PSSC Physics	17.2	4.3	6.9	17.6	40.0
Project Physics	21.1	4.3	6.9	26.5	46.7

Responses to the survey questions asking for a listing of science courses taught appear to suggest a basic core of science courses in Ohio's secondary schools. At least one section each of Biology, Chemistry, and Physics was listed by all respondents. In addition, at least one section of Physical Science was indicated by 47 percent of the respondents, and at least one section of Earth Science was indicated by 45 percent of the respondents. Appendix B gives a listing of course titles for the categories identified in the questionnaire.

In general, responses indicated that science courses tend to be full-year courses. Only 16 percent of the schools responding indicated that they offer semester courses in science and only 8 percent indicated courses which were nine weeks in length.

Secondary science classes typically fall into two categories: single-period and double-period. The average single-period science class is 55 minutes in length with a range of 49 to 60 minutes. The typical double-period class is 75 to 90 minutes in length. The data indicates that science courses designated as laboratory courses generally meet the 160 clock-hour requirement of Minimum Standards.

APPENDIX A

Survey Questionnaire

SURVEY OF OHIO SECONDARY SCHOOLS

1981

SCIENCE

IDENTIFICATION INFORMATION

NAME OF SCHOOL _____
 SCHOOL DISTRICT _____
 COUNTY _____ SCHOOL ID# ☐ ☐ ☐ ☐ ☐ ☐

DIRECTIONS: This questionnaire is to be answered by the department chairperson. Please check over the questionnaire to get an idea of the scope of the questions asked before beginning to fill out the form. Discuss questions with your department staff as you deem necessary. Check (✓) or fill in every item that applies. Thank you for your time.

STAFF/STAFF DEVELOPMENT

1. Does the department have a chairperson? No __, Yes __, Full-time __, Part-time __
2. If yes, does the chairperson receive: Release Time __, Compensation __, Both __, Neither __
3. Is there a written job description for the department chairperson? Yes __ No __
4. How many teachers in your department? Full-time __ Part-time __
5. How many department meetings are held each year? 0 1-3 4-6 7-9 More than 9
(circle appropriate item)
6. Department meetings are characterized by which of these activities? (check all that are applicable)
 - Keeping "ALIVE" professionally _____
 - Learning about new curricula _____
 - Learning new audiovisual materials _____
 - Studying new methods of teaching _____
 - Analyzing problems, such as discipline, faced by all teachers _____
 - Facilitating the use of new textbooks _____
 - Providing opportunity for teachers to share ideas with other teachers _____
 - Building enthusiasm for teaching _____
 - Describing new materials and information of direct use in the classroom _____

CURRICULUM DEVELOPMENT

7. Is a program evaluation conducted prior to course of study revision? Yes __ No __
8. To your knowledge do teachers use the course of study in preparing for instruction? Yes __ No __ Sometimes __

9. How often are courses of study revised in your district? Annually __ every 3 yrs. __ every 5 yrs. __ longer than 5 years __
(circle appropriate item)
10. What percentage of your staff is involved in course of study revision? 0-20% 21-40% 41-60% 61-80% 81-100%
(circle appropriate item)
11. Are students included in course of study revision? Yes __ No __ Sometimes __
12. Are community members included in course of study revision? Yes __ No __ Sometimes __
13. Does the course of study reflect program continuity, K-12? Yes __ No __
14. Do you have a program for gifted students which has substantially different content from the regular program? Yes __ No __ Level: 9, 10, 11, 12
(circle appropriate level)
15. Do you have an advanced placement program for students to earn college credit? Yes __ No __
16. Does each science laboratory have a teacher demonstration desk? Yes __ No __
17. Do your science courses use any of the federally funded materials listed to the right. Check all the appropriate items.
 - BSCS Green _____
 - BSCS Yellow _____
 - BSCS Blue _____
 - Chemical Bond Approach _____
 - CIEM Study _____
 - ESCP _____
 - IPS _____
 - ISCS _____
 - PSSC Physics _____
 - Project Physics _____
18. Is there a board policy requiring a minimum enrollment for science classes? Yes __ No __
19. Do any of the scheduled science classes have more than 24 students? Yes __ No __ How many __
20. Do all science courses include student laboratory work? How often? Yes __ No __
Once a week __ Once a month __ Occasionally __
21. If you have some courses which do not require laboratory work, please list them. _____

22. Is there at least one separate laboratory for each kind of science taught?

23. Is each laboratory large enough to accommodate real experimentation?

24. Is there an annual, verified safety check of each laboratory?

25. For each item listed to the right please check whether or not it is available in each science laboratory or to each student.

Life Sci: Yes ___ No ___
Chem: Yes ___ No ___
Physics/Phys. Sci: Yes ___ No ___

Yes ___ No ___

Yes ___ No ___

By whom
(Agency) _____

	Yes	No
Eyewash Fountain	_____	_____
Eyewash Station	_____	_____
Shower	_____	_____
Fire Blanket	_____	_____
Fire Extinguisher	_____	_____
First Aid Kit	_____	_____
Two Exits	_____	_____
Goggles	_____	_____
Visitor Spectacles	_____	_____
Safety Glasses	_____	_____
Aprons	_____	_____

26. In a period of one year how many accidents occur in your science classes?

None, 1, 2, 3, 4, 5, More than 5
(circle appropriate item)

27. Is ample space provided for the storage of supplies and equipment?

Yes ___ No ___

28. Do the science classes have adequate supplies and materials?

Yes ___ No ___

29. Does the science department budget appear as a separate account within the whole school budget?

Yes ___ No ___

30. Have all science teachers been instructed about safety and accident procedures?

Yes ___ No ___

31. Do high school science teachers have the opportunity to interact with elementary, middle, and junior high school science teachers?

Yes ___ No ___

32. If yes, how often do they meet?

Once a month ___ Twice a year ___ Once a year ___

33. Do your science students have the opportunity to participate in science clubs?

Yes ___ No ___

Name of club(s):

34. Do the students participate in:
Science Fairs (local, district, state)

Yes ___ No ___

35. Science and Humanities Symposia

Yes ___ No ___

36. JEIS (Competitive test for students)

Yes ___ No ___

37. Other (name) _____

Yes ___ No ___

38. Do any of your classes have the availability of a computer?

Yes ___ No ___

39. If yes, which courses?

Gen. Sci. ___ Bio. ___ Chem. ___ Phys. ___
Other ___

40. Students are required to receive credit in how many science courses for graduation?

1 ___ 2 ___ More than 2 ___

41. Do students have an option in selection of courses to meet the requirements for graduation?

Yes ___ No ___

42. If a course(s) is specifically required for graduation please name it.

43. If students have an option in selection of courses to meet the graduation requirements, list the courses from which the choice may be made.

_____ any science course in the schedule.

44. List the course(s) most generally selected to meet graduation requirements.

What percent of the total student enrollment is:

45. enrolled in Chemistry

46. enrolled in Physics

To your knowledge how do the above percents compare to previous years for:

47. Physics
48. Chemistry

Increase ___ Decrease ___ Same ___
Increase ___ Decrease ___ Same ___

49. Do you have a competency program for science?

Yes ___ No ___

50. Have science courses been dropped over the past three years?

Yes ___ No ___

51. If yes, name the courses dropped.

52. Have science courses been added over the past three years?

Yes ___ No ___

53. If yes, name the courses added.

54. In the science departments future planning, does it appear that course offerings will

Increase ___ Decrease ___
Remain the same ___

CLASSROOM STRATEGIES

The common forms of organization for student groups in classroom instruction are indicated below. Please indicate the frequency with which each form is used by the teachers on your staff.

		Rarely or Never	Occasionally	Most of the Time
55.	Entire Class As A Group			
56.	Small Groups			
57.	Students Working Individually			

Within these groupings a variety of specific instructional strategies are used. Please indicate the frequency with which each form is used by your teachers.

		Never	Less than once a week	At least once a week	Just about daily
58.	Lecture				
59.	Discussion				
60.	Student Reports/Projects				
61.	Library Work				
62.	Students At Chalkboard				
63.	Individual Assignments				
64.	Students Using Manipulatives				
65.	Televised Instruction				
66.	Programmed Instruction				
67.	Computer Assisted Instruction				
68.	Tests Or Quizzes				
69.	Contracts				
70.	Simulations				
71.	Field Trips				
72.	Guest Speakers				
73.	Teacher Demonstrations				

COURSE INVENTORY

Directions: Using the broad categories identified, please list by name all science courses taught in your school. For each course indicated please fill in the appropriate information. Thank you.

*Formula for calculating length of period X #days
hours scheduled per year 60
is:

Subject Category	# Sections Scheduled	Total Enrollment Per Year	Length of Period (in minutes)	Hours Scheduled Per Year *	ODE use only
74. Earth Science (Such as: Geology, Meteorology, etc.)					
75. Life Science (Only for grades 9 and above)					

Subject Category	# Sections Scheduled	Total Enrollment Per Year	Length of Period (in minutes)	Hours Scheduled Per Year	ODE use only
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76. Physical Science (Such as: IPS, ISCS, etc.)

77. Environmental Science (Such as: Pollution, Ecology, etc.)

78. General Science (Only for grades 9 and up)

79. Biology (Only for grades 9 and above)

Subject Category	# Sections Scheduled	Total Enrollment Per Year	Length of Period (in minutes)	Hours Scheduled Per Year	ODE use only
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80. Chemistry (Such as: Traditional, CIEM Study, etc.)

81. Physics (Such as: Traditional, PSSC, etc.)

82. Other (Such as: Unified Science and Math, etc.)

APPENDIX B

Course Titles by Categories

EARTH SCIENCE

Earth Science I
Geology
Astronomy
Metereology
Advanced Earth Science
ESCP Earth Science
Modern Earth Science
Oceanography
Aviation and Space Science
Beginning Earth Science
Earth Science Adj.
Earth Science Adv. Gifted
Earth Science-A
Earth Science-B
Earth Science II
Earth's Oceans
Geology of Ohio
Geology/Metereology
ISCS
Space Science
Special Education
Astronomy
Geology
Introduction to Stargazing

GENERAL SCIENCE

General Science II
College Prep
Topics In Science
Science 9
Comprehensive Science
Science Survey
Academic Freshman Science
Practical Science
Exploratory Science
Fundamentals of Science
Developmental Science
Survival Science
General Science Honors

LIFE SCIENCE

Life Science
Physiology
Natural Science
Special Education
Animal Behavior
Heredity
Prehistoric Life
Biogeography
Diseases
Human Structure & Functions
Birds of North America

PHYSICAL SCIENCE

Physical Science
College Prep (10th Grade)
IPS
APS
Basic PS
ISCS
Ideas in PS
Matter & Energy
I-I-S
Advanced PS
Introduction to Science
PS-A
PS-Investigations
PS II

ENVIRONMENTAL SCIENCE

Environmental Science
Ecology
Population & Pollution
Terrestrial Ecology
Aquatic Ecology
The Earth & Universe
Environmental Biology
Ecology

BIOLOGY

Biology
Biology II
College Prep
Human Biology
Animal Biology
AP Biology
BSCS Yellow
BSCS Blue
BSCS Green
Human Physiology
Honors Biology
Library
Science & Tech-BSCS
Biology Chemistry
Advanced Biology-Anatomy &
 Physiology
BSCS Beginning Biology
Biology BSCS
Advanced Biology
Biology 9
Lad Biology
Biology Lecture
The Cell
Genetics
Anatomy/Physiology
Human Body & Diseases
Microbiology
Modern Biology
Accelerated Biology
Human Anatomy & Physiology
Living Things
Balance of Nature
Basic Biology
Biology R.
Sr. Biology
Lab Biology BSCS
T.A.G. Advanced Biology
Biology 10
Academic Biology
Biology II - AP
Introduction to Biology
Practical Biology
Biology I-A
Biology I-H
Biology Enriched
Microbiology
Comparative Anatomy
Advanced Biology
Botany
Zoology

CHEMISTRY

Chemistry
Chemistry II
College Prep
Chemistry Advanced Inorg.
Chemistry Advanced Org.
Modified CBA
Honors Chemistry
Chem II & AP
Health Chemistry
Chemistry Lab
Chemistry Lecture
IAC Chemistry
Chemistry Applied
Chemistry S
Chemistry G
Chemistry I-A
Chemistry II-B
Action Chemistry
Modern Chemistry
Accelerated Chemistry
Chem Study
AP Chemistry
Advanced Chemistry II
Chemistry Mixtures
Chemistry Reactions
Chemistry I Fundamental
Pre AP Chemistry
T.A.G. Chemistry
Chemistry I-Honors
Introduction to Chemistry
AP Chemistry Lab
Academic Chemistry
Technical Chemistry
Principles of Chemistry
Inquiries in Chemistry
Advanced Chemistry
Introduction to Chemistry I
Introduction to Chemistry II

PHYSICS

Physics
Physics II
College Prep
Modified PSSC
W/calculus PSSC
PSSC-Project Physics
Advanced Physics-Modern
Advanced Physics-Regular
Harvard
PSSC
Major Physics
Non Major Physics
Physics Lab
Physics Lecture
Honors Physics
Physics S
Advanced Placement Physics
Modern Physics
Traditional w/PSSC
Mag.-Elect.
Intro. Physics
Advanced Physics
Everyday Physics

OTHER

Sr. Project
Aviation
Computer Programming
Research
Individual Investigation
Photo I
Photo II
Science Seminar
Bio. of Conditioning
Energy
Computer Science
Advanced Health
Modern Astronomy
Electronics
How Things Work
Air Science
Problems In Science
Problems In Science II
Sr. Science Concepts
Unified Science
Independent Study
Science and Fiction